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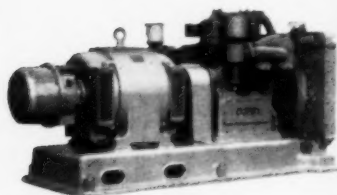
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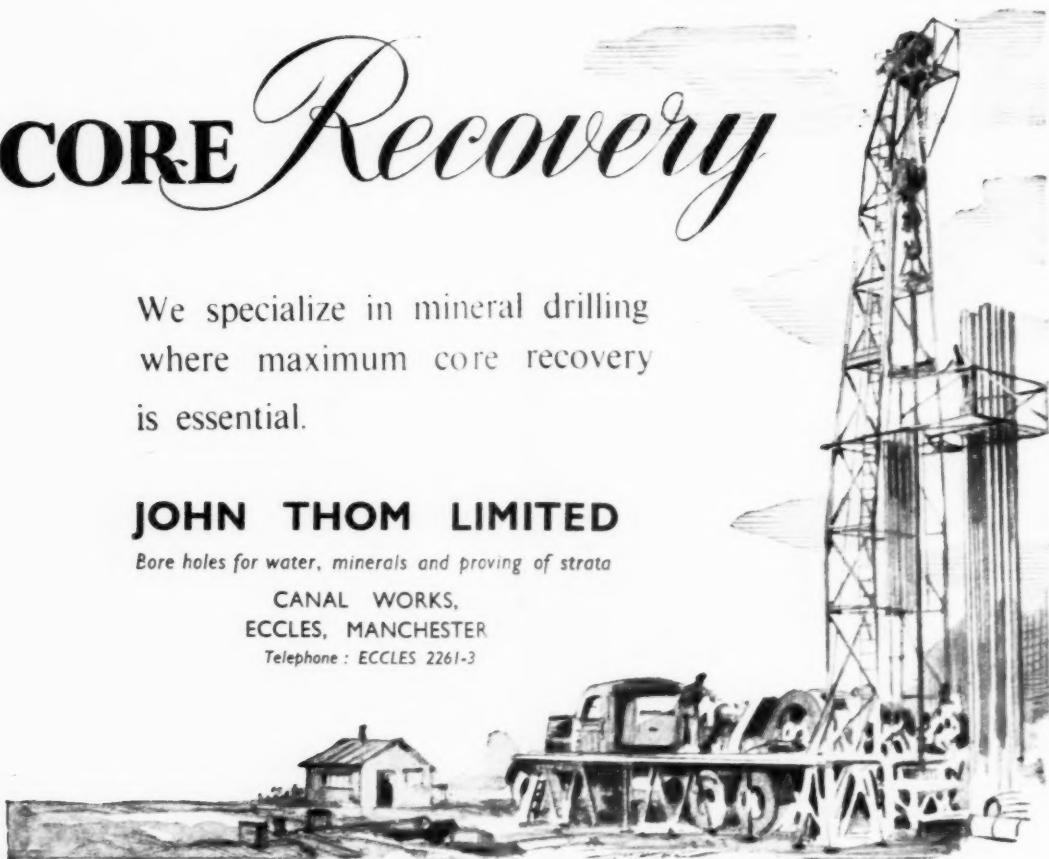
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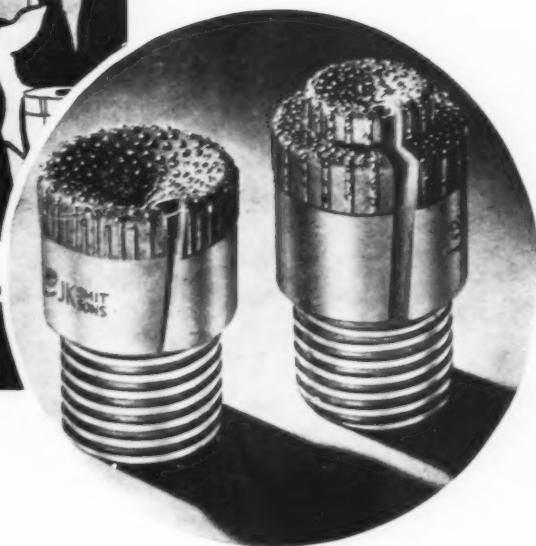


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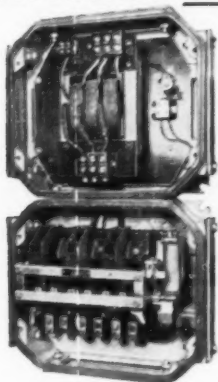
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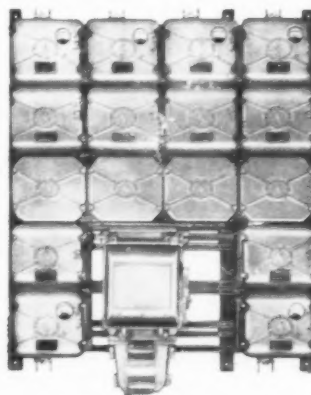
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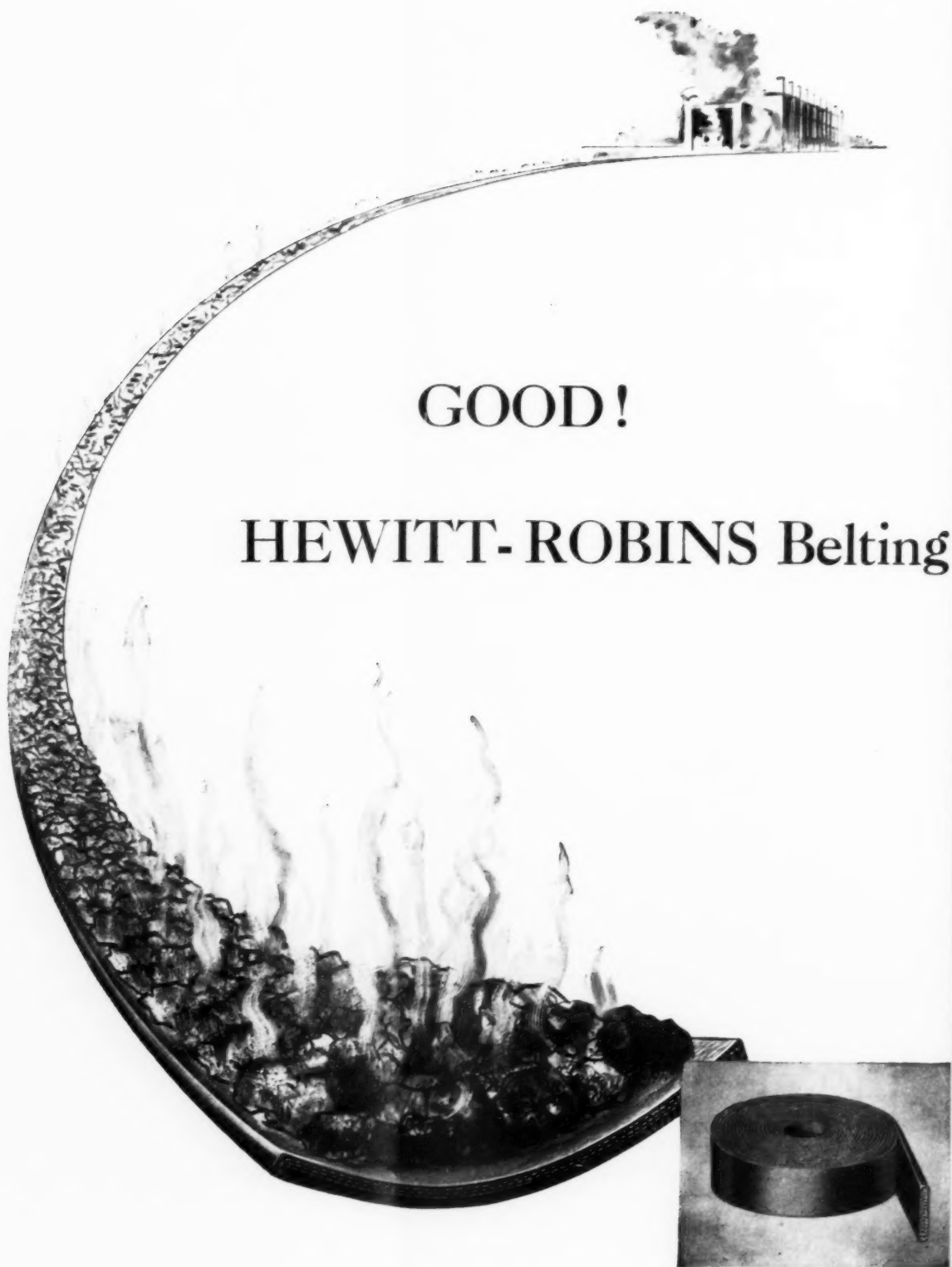
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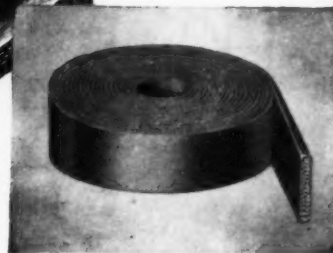
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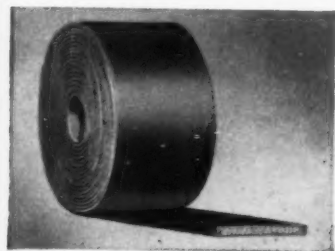
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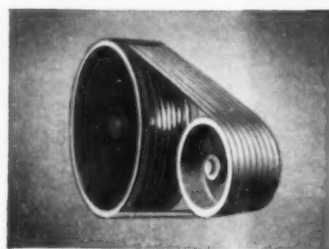
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The Mining Journal

Established 1835

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NOTES AND COMMENTS

Bank Chairmen Analyze U.K. Economy

From any economic standpoint the year 1955 was a momentous one for the United Kingdom. A swift and serious re-emergence of inflation took place and was tackled firstly by two successive rises in Bank Rate and followed by a personal directive from the Chancellor of the Exchequer to the banking system requiring substantial reductions in advances to be made without delay. Against this background it was hardly surprising that the "Big Five" chairmen, in their customary analyses of the country's economic position were, to say the least, critical. Indeed, gold and dollar reserves had ended the year in a sadly depleted condition besides which a large deficit had been incurred on invisible trade balance.

Broadly speaking, the five chairmen differed little in their opinions regarding the economy's basic ailments. Over-full employment attracted much of the blame for inflation. While a satisfactory method of living under these conditions had not yet been evolved, there was an acute awareness that the employment solution to the problem lay in the direction of bringing more into balance the present disequilibrium between demand and supply for labour. Excessive home demand presented a more tangible difficulty which, it was hoped, would be curtailed by credit restrictions. Yet monetary control as a universal panacea engendered little confidence. More enthusiasm was expressed for the need to restrict unabated Government expenditure which was seen as an inflationary force of the greatest magnitude. Government outlays in the main constituted unremunerative investment and as such should be the first to suffer.

Mr. A. W. Tuke, chairman of Barclays Bank, had a good deal to say on the question of over-full employment. He described this problem as lying at the root of the country's troubles. No remedy could be found for present inflation so long as the present situation continued however much the credit squeeze reduced bank advances. Somehow or other, an affirmative answer must be found to enable the benefits of full employment to be enjoyed without the stimulus of continuous inflation. Giving figures to illustrate the relationship between numbers of unemployed and vacancies registered at Labour Exchanges, Mr. Tuke

pointed out that for much of the past year every unemployed man could choose between at least two jobs. A situation similar to this had prevailed during each of the three biennial crisis years, 1947, 1949, and 1951. Although the reduction of unemployed to its present negligible figure was a fine advertisement for a Conservative Government, from an economic point of view it was thoroughly unhealthy. In a very similar vein Lord Aldenham, chairman of the Westminster Bank, stated that a key problem of 1956 would be whether wages and profits continued to rise faster than production. If they did, the price spiral would be given another twist and U.K. competition in export markets thereby endangered. The Trades Union Congress in their courageous November statement had shown a full appreciation of the situation which was most encouraging.

Stimulated by over-full employment domestic demand during 1955 expanded disproportionately thus contributing towards present inflationary difficulties. And inflation, as Sir Oliver Franks, chairman of Lloyds Bank reminds, is doubly dangerous for a country such as the U.K. dependent as it is upon exports for its living. But Sir Oliver goes a little further than this generally accepted maxim, and sees the country's failure in recent years to obtain its share of expanding world markets from a somewhat unusual angle. Our troubles, he submits, have been due largely to delays in delivery and lack of incentive to enter export markets rather than to excessive prices. Should this have been so, he points out, disinflation ought not only to restrain imports but also give a fresh impetus to exports. On the whole Sir Oliver had great confidence in our future ability to avoid a deficit in the balance of payments.

By giving a comparison between figures of Government expenditure and Bank advances during 1937-38 and the present, Mr. D. J. Robarts, chairman of the National Provincial Bank, touched on a matter of great interest. In 1937-38, he said, above the line Government expenditure totalled £844,000,000 while in April, 1938, bank advances were £994,000,000. The corresponding figures for 1954-55 were: Government expenditure £4,305,000,000 and bank advances in April, 1955, £2,068,000,000. Government expenditure had thus multiplied five times between 1937 and 1955, although bank advances had little more than doubled.

These figures, he said, showed how domestic finances of the country were overshadowed by Government spending. Mr. Roberts thought that credit restriction could only have a very limited effect on the whole field of national expenditure. What was needed was a reduction in the volume of demand for credit which was linked with Government expenditure and excessive public consumption. Mr. A. W. Tuke's view differed very little from this but he made the additional comment that Government expenditure need not be inflationary if covered by taxation. When such expenditure was undertaken on borrowed money, however, a large volume of additional demand was immediately created to set against the available supply of goods and services. There was not much sign, he said, that the Government were taking active steps towards reducing expenditure. In fact, the April budget had provided for outlays of £436,000,000 to be financed by borrowing. Central and Local Government expenditure combined represented some 40 per cent of the gross national income.

Some important comments on the necessity of maintaining the value of the £ were made by Lord Harlech, chairman of the Midland Bank. People outside the U.K. took a severely utilitarian view of the £ and in the long run were less and less impressed by any claim it might have to historic status. It was the course of events which would decide whether the £ was over or under valued at current rates in terms of other currencies. It was a commonplace that confidence in the £ was vital to the welfare of the country.

Greater Freedom for Gold

At the end of 1954 the total world stock of gold, excluding that of the U.S.S.R., was estimated at \$36,500,000,000. Before the war the gold stock amounted to little more than \$25,000,000,000, so that since 1939 it has increased by only some 45 per cent. On the other hand, U.S. dollars, which before the war formed one-tenth of total exchange reserves, have increased almost ten times in the same period. It is scarcely surprising, therefore, that gold should command as firm a market as ever for exchange reserves and as a "lubricating" medium for international trade, despite the fact that its monetary use becomes yearly less important.

The London gold market, reopened in March, 1954, after an interval of 15 years, has recaptured its former position as the centre of world trading. Its operations have had the effect of greatly reducing the scope and fluctuation of the so-called "free market," which has consequently lost much of its former influence. Throughout the whole year the London price expressed in dollars per ounce varied only between 35.06 and 34.96, a difference of about quarter per cent. Expressed in sterling fluctuations have been a little wider, the highest price of the year, 251s. 11d. being quoted in February when sterling was under heavy pressure and the lowest 249s. 4½d. on December 14 and 15. Since the beginning of the present year the trend has been slightly downwards and at the time of writing the official price in London is 249s. 3d.

During the first half of the year the price of gold varied directly with the dollar-sterling cross rate, the highest price of the year, 251s. 11d. being quoted on no less than seven days in February. The pressure on sterling abated with the increase in the Bank Rate on February 24 but revived again in the summer, rising to 251s. 9½d. on July 21. Throughout this period the dollar price had varied only between about \$35.04 and \$35.06. There were unexpectedly large offerings in September, however, possibly on Russian account, and the central bank buying was withdrawn. As a consequence the price fell rapidly and remained between \$34.96 and \$34.98 for the rest of the year, except for two

days at the end of November, when there seemed to be a special demand and it rose to \$34.99 on a large turnover. Since gold is valued at \$35 per oz. in settlement of E.P.U. differences, it is surprising that the London market should have remained below this figure for such a long period.

The decline in free market prices can be ascribed to increased confidence in national currencies, which has been a major factor in easing restrictions in gold dealings. We have recently witnessed the re-opening of a free gold market in Belgium and the liberalization of gold trading rules in other Western European countries. Several governments have even resumed the minting of gold coins once again for sale to the public. Gold coins still command a premium over bar gold because of their attractions for small holders and minting is therefore a profitable undertaking. It will be interesting to watch the effects of these developments on the bullion markets.

Trading in gold—bars, coins and all other forms of the yellow metal—was resumed in Brussels on January 3 this year. When ingots of fine gold are purchased to cover a purely monetary transaction, the sale is exempt from sales and income tax. Gold imports by bankers, stockbrokers and private individuals are also exempt. Tax exemption is not applicable, however, to purchases made by jewellers, goldsmiths or other consumers who intend to process the gold in any way. Bankers and stockbrokers who sell gold in Belgium are compelled to ensure the collection of any sales tax which may be due on the transaction. Luxembourg's rules on gold trading have similarly been relaxed.

Belgium is hopeful of capturing some of the brokerage business which has gone to Britain since the re-opening of the London market. It has the advantage of closer proximity to continental customers, who occasionally require actual delivery of the gold they buy or wish to surrender what they sell. Most gold transactions, however, involve no physical shipments.

Printing Dispute Alters "M.J." Contents

The printing dispute, now in its third week, has now led to a change in content and a reduction in size of *The Mining Journal*. Our regular feature, Mining Markets has been omitted and the London Metal Exchange prices given for copper, lead, tin, zinc are those ruling at the close of trading on Wednesday rather than on Thursday. *The Mining Journal* is not a party to the dispute.

Portugal

(From Our Own Correspondent)

Foz do Douro, January 12.

During November, Portugal exported 274 tonnes of tungsten bearing material, 16 tonnes of cassiterite and 18,390 tonnes of cupreous pyrites. During the same period a total of 3,556 tonnes of haematite and 228 tonnes of white arsenic were exported. Tin metal exports amounted to 13,360 kilos for the month.

In September, production of beryl totalled 22 tonnes, while that of lead and cassiterite was 183 and 141 tonnes respectively. Production of mixed cassiterite/ilmenite was four tonnes, manganese 266 tonnes, and mixed cassiterite/scheelite seven tonnes. Only one tonne of molybdenum was produced during the month, as was the case with tantalite/columbite. Some 765 tonnes of mixed gold/silver concentrates were produced, 323 tonnes of wolframite, 26 tonnes of scheelite and 75 tonnes of mixed wolframite/scheelite.

Minerals of the Antarctic

Geological exploration in Antarctica has revealed a geological environment which strongly supports the belief that valuable mineral deposits may exist. This is one of the factors responsible for present interest in the Continent, where vast territorial claims are likely to be made. The known geological features of Antarctica and the difficulties facing prospectors are discussed in the following article.

When Amundsen succeeded in reaching the South Pole, it was believed that no further attempts would be made to penetrate the frozen wilderness, for at that time the chief aim of all Polar exploration was to reach the geographical and magnetic poles. After the First World War, however, various factors combined to renew interest in Antarctic exploration. To-day the most valuable whale fisheries in the world are in Antarctic and Sub-Antarctic waters. With the development of long distance flying, the Polar regions have come to assume a new importance, since they lie on the shortest route between thickly populated territories. Then again, meteorological researches in the Polar regions are proving of immense value in the interpretation of weather conditions throughout the world. Finally, coal has been discovered within 150 miles of the Pole and there is evidence of the existence of valuable mineral deposits, including pitchblende and uranium ore. Indications have also been found of other minerals such as copper, silver, gold, molybdenum, graphite, lead, hornblende (composed mainly of silica, magnesia and lime) and oil. Some scientists are of the opinion that the Continent bears the richest iron ore seams on earth, and there are signs of sufficient coal to develop power for exploitation.

THE ANTARCTIC LAND RUSH

Because of its great potential wealth in minerals and oils, and its equal potential importance as a strategic base, it is believed that vast land claims in Antarctic—the earth's last unexplored continent—will be made by all twelve nations now taking part in a two years' programme of scientific research. The international geophysical year 1957-58 is drawing teams of scientists to Antarctica from Britain, the U.S., the U.S.S.R., Australia, New Zealand, France, Japan, Argentina, Chile, South Africa, Belgium and Norway. As soon as they have set up their observation bases these countries are expected to make territorial claims on the Continent. Some claims already made by them overlap. Since Antarctica is as big as the U.S. and Europe combined, however, it is considered that that each claimant will eventually hold accepted rights over as much territory as it can develop and use.

Britain's advance party, under Dr. Vivian Fuchs, recently

established a base at Vahsel Bay, on the edge of the Continent, after their ship, *Theron*, had fought her way out of an ice-pack which hemmed her in for nearly a month. Dr. Fuchs was leader of the Falkland Islands Dependencies Survey from 1948-50 and of the party who were marooned for two years on Stonington Island a hundred miles inside the Antarctic Circle. The Falkland Islands Dependencies lie between longitudes 20 deg. W. and 80 deg. W. and extend as far as the South Pole. They consist of a number of scattered territories, including South Georgia, South Sandwich Islands, South Orkneys, South Shetlands, the Graham Land Peninsula, and Alexander I Land.

British policy in the Antarctic is based on the belief that possession of a large tract of the earth's surface carries with it responsibilities which cannot be neglected on account of physical difficulties. Recognition of these obligations led to the establishment of the Falkland Islands Dependencies Survey, which in 1946 replaced the wartime naval operation "Tabarin". The Survey has two main objectives, one being the discovery by scientific investigation of the potential of the Dependencies, and the other maintenance of the administration of H.M. Government in what may become a very important territory.

The Survey consists, in effect, of a series of major Antarctic expeditions and constitutes the biggest operation of its kind carried out in Antarctica. A number of bases have been set up on the mainland and on the adjacent island groups, six or seven of them being occupied each year. All survey and geological work on the Peninsula has been made by sledge, either on the ice shelf, the sea ice, or directly on the snow-covered land.

GEOLOGICAL LINK WITH S. HEMISPHERE

The work of the Survey's geologists includes a study of the structure of the Antarctic Continent in order that it may be related to the known geology elsewhere in the Southern Hemisphere. In 1952, the writer was informed by Dr. Fuchs that so far no exploitable minerals had been discovered within the territories comprising the Falkland Island Dependencies, and only in certain places would it be possible under normal conditions to work deposits economically, unless their importance was such that expense was a minor consideration. It may well be, however, that in some of the outlying islands there are valuable mineral resources, which could be worked in the same way that coal is mined in Spitsbergen in the Arctic. Such exploitation would need the assistance of both ships and aircraft. Prospecting is very slow and difficult on account of the precipitous terrain and the extremely heavy snow and ice cover, not more than one per cent of Antarctica being exposed rock.

Though only a very small proportion of the land surface of Antarctica is exposed to view, valuable geological information has been gained not only from the limited areas laid bare to direct information, but also from transported morainic debris drawn from wide areas, to appear in time at the surface of the ice.

The foundation rocks are similar to those of pre-Cambrian age found in the north, and con-



Gondwanaland and Laurasia with orogenic belts, from Dr. A. Holmes' *Principles of Geology*, 1944.

sist of gneisses and schists, crystalline limestone and quartzites. Western Graham Land was found to be entirely formed by ancient crystalline rocks, granites, greenstones and syenites. Cape Tuxen is a gigantic wall of green diorite.

The limestones of the Beardmore Glacier, occur in horizontal beds several hundred feet thick. The colour of the limestone varies from pink to dark grey, while beds of black limestone containing corals also occur.

Silurian slates and greywackes which are fossiliferous are found in alternating beds in the South Orkneys, one bed being from 600 to 800 ft. high. A very large amount of granite of various kinds has been noted on the Ross Sea coast, most of it probably intruded after the Cambrian age.

The Beacon Sandstone, which occurs extensively in Antarctica, was first noted in the Royal Society Range of Victoria Land, where it is at least 2,000 ft. thick, with thin beds of shale. A similar sandstone occurs to the north, associated with beds of coal, shale and limestone. In the Beardmore district it appears as limestone, calcareous sandstone, beds of coal and shale.

ROCK FORMATION OF THE CONTINENT

According to J. Gordon Hayes, in his book *Antarctica*, the most interesting of these deposits are the coal seams in the Upper Beacon Sandstone of the Beardmore Glacier, within about 300 miles of the south geographical pole. Professor Seward, who examined plant fossils brought back by Captain Scott, concluded that in Carboniferous times the hills of Antarctica had a little vegetation and the climate at that time must have been comparatively mild and humid. A total thickness of about 25 ft. of coal was found by Commander Wild in seven seams, with sandstone and shale between them. Coal measures were also found by Taylor and Debenham in the Granite Harbour district.

One of the most important discoveries was made in the Terra Nova district by Priestley, who found fossil stems 12 to 18 in. in dia. and fragmentary impressions of even larger trees. Fragments of coal and pieces of fossilized woods have been dredged from the sea 1,400 miles and more from the Beardmore glacier.

The discovery of coal in Antarctica is regarded as an indication that either the earth's crust was heated, until the Carboniferous age, more by its own than by solar heat, or that the Poles have moved a few thousand miles.

In South Victoria Land a sill of dolerite, usually columnar and of 1,500 ft. maximum thickness, intrudes the Beacon Sandstone. In the Ferrar Glacier District it occurs as a sill of 300 ft. in thickness, dividing two different kinds of granite. This is known as the McCurdo Sill and covers an area at least equal to that of the British Isles.

The Jurassic Order is represented in Graham Land by the greywackes and slates of Hope Bay, which are rich in fossil flora of numerous species, and also by the sandstones of Snow Hill, Seymour and Cockburn Islands. In the latter area the Cretaceous Period is quite as well represented as the Jurassic. Upper Oligocene and Lower Miocene sandstones occur at Seymour Island, while Miocene limestones have been noted at Campbell Island in the Sub-Antarctic zone.

A series of great faults occurred over very wide areas at the end of the Miocene period, the present Antarctic Plateau being regarded as the upthrow of one or more of them. There was a similar outburst of volcanic energy which involved the Balleny Islands, Cape Adlare and the Ross Archipelago and has not yet completely died out.

Mount Erebus and Sturge Island in the Balleny Group are still active. Vast quantities of large and perfect felspar crystals were found during the first ascent of Mount Erebus, made by Sir Edgeworth David, Sir Douglas Mawson, and other members of Shackleton's first expedition.

It was announced in *The Times* of January 10, 1955, that an exploring team had discovered a range of mountains in Australian Antarctic territory thought to be one of the major features of the continent. Rising to 10,000 ft. and running for more than 100 miles, they are reported to be largely free of ice-covering.

MINERAL POSSIBILITIES

The mineral possibilities of Antarctica were recently reviewed by G. A. Schnellman, Ph.D., A.R.S.M., M.I.M.M. (*The Mining Journal, Annual Review*, May, 1955, pp. 79-83). Schnellman considers that the geological environment revealed by exploration over the past 20 years strongly encourages the expectancy that mineral deposits of a kind worked in the more familiar parts of the world exist. He points out that, geologically, Antarctica consists of two parts, the smaller of which—amounting to about a quarter of the whole—represents an extension of the Andes mountain chain. It is not unreasonable to base exploration on the possibility that this extension of rock types and structure will carry with it orebodies of the types which have made Columbia, Peru, Bolivia and Chile famous in mining history.

The greater part of Antarctica consists, however, of crystalline rock types forming part of the ancient continent postulated by geologists as long ago as the 1880's and given by Suess the name Gondwanaland. Other portions of this once continuous land mass now form the southern part of India, Africa south of the Atlas Mountains, South America east of the Andes, and almost the whole of Australia. The late Sir Lewis Fermor, in his presidential address to the Institution of Mining and Metallurgy, listed 33 minerals which are produced in the accessible parts of this continent. It is unthinkable that the inaccessible parts should be barren of them.

Particularly significant is the world's almost complete dependence on Gondwanaland for the minerals which are vital to this age of nuclear development. In 1948 some 50 per cent of the world's total production of uranium ores came from Gondwanaland, as well as 100 per cent of the outputs of monazite, zirconium ores and columbite, and 90 per cent of the world supply of beryllium ores. It is not hard, comments Schnellman, to foresee these providing adequate stimulus for prospecting Antarctica.

Writing in 1925, David Hunter Miller stated that any form of mineral wealth in the Antarctica was no more than a remote possibility of the unknown. Geological knowledge of this strange continent has since been considerably advanced. In particular, the progress of aviation and the development of modern aerial photography have provided explorers with opportunities for geological research which were undreamed of in the days of Scott.

Geologists have been thwarted by the barrier of pack ice which is extremely difficult to penetrate. Future expeditions will be able to operate either by aeroplanes from bases on the flanks or by seaplanes from pools within the outer portion of the pack ice itself. Reconnaissance, the conveyance of sledge parties to suitable points, and the supply of necessary stores, are all operations which can be undertaken by planes. To make geological observations from the air requires little equipment. Helicopters have been used by the Geological Survey of Canada for exploring large territories in the Arctic.

GRAPHITE—I

Graphite as an Industrial and Nuclear Material

Graphite's outstanding properties as a moderator for nuclear reactors have focused renewed attention on a mineral whose industrial importance is far greater than the relatively small scale of consumption suggests. Some aspects of the production and utilization of this mineral are here described. A subsequent article will be devoted to applications in the nuclear field.

The United Nations publication, *Peaceful Uses of Atomic Energy*, brings together the technical information submitted at the International Conference held at Geneva during August, 1955. The third volume in the series is now available and provides a complete summary of the status of reactor technology in August, 1955. (Vol. III *Power Reactors*, H.M.S.O., price 54s.) From the mining standpoint one of its most interesting features is the light it throws on the utilization of metals and minerals in atomic energy programmes. Much has already been published about the nuclear uses of uranium, zirconium and beryllium, but up to the present little publicity has been accorded to the very large potential outlet which exists for graphite in the generation of nuclear energy. Yet it seems evident that this new field of application might well become large enough to have a significant impact on the economics of a mineral which, because of the small level of overall consumption, has been extremely sensitive to fluctuations in demand.

Graphite is a crystalline form of carbon which occurs naturally in many parts of the world. Its chief characteristics are black colour, metallic lustre, flakiness, extreme softness, high conductivity for heat and electricity, refractoriness, and chemical inertness. Economic deposits of pure graphite are unknown, the term as used commercially covering any crude ore, concentrate or dressed product which is used in industry because of its graphite content.

The use to which a graphite may be put depends largely on the physical characteristics of the crystals. In the classification adopted by the United Kingdom three different types of natural graphite are recognized, and also an artificial product. The variety known as crystalline graphite or plumbago is characterized by the interlocking mass formed by the crystals, which breaks into blocky grains. Production is confined to Ceylon. Flake graphite occurs as individual flakes disseminated through a host rock. The term is only applied to material having flakes large enough to be seen by the naked eye, which are recovered by milling and screening. Rock in which the graphite is present as microscopic flakes is termed amorphous graphite. Natural mixtures of the commercial varieties occur in many different proportions. Artificial graphite is actually a pure crystalline variety, the only artificial attribute being the method of production.

In the U.S. the flake and crystalline types are included in a single classification, which is sub-divided into flake, lumps, chip and dust.

WORLD PRODUCERS

In the vein-like deposits of Ceylon the mineral occurs as embedded masses, veins, lenses or pockets of almost pure graphite. The general run-of-mine samples analyse from 75 to 90 per cent carbon. Despite the high quality of its product, Ceylon's graphite mining industry has experienced many vicissitudes during the past hundred years, fluctuations in demand and market prices being reflected in considerable variations both in total output and in the number of mines at work. In 1953 and 1954 production amounted to 7,218 and 7,755 l.tons respectively.

By far the most important of the world's deposits of flake graphite are those of Madagascar, in which the

mineral is concentrated within highly irregular masses up to 90 ft. wide and averaging about eight per cent graphite. The average yield from one of the oldest workings in Madagascar was stated to be about one ton of standard flake graphite containing 90 per cent carbon and one ton of dust containing 80 to 86 per cent carbon from about seven tons of crude ore. In 1953 Madagascar's output amounted to 13,325 tonnes.

Beds of amorphous graphite, formed by metamorphism of coal seams and carbonaceous shale beds, are of quite common occurrence. The best-known deposits of this group as those of Mexico, which consist of steeply dipping beds up to 7 ft. thick, assaying 80 per cent or more graphitic carbon. In 1953, Mexico had an output of 30,330 s.tons and was by far the largest producer of natural graphite.

Among other major producers are Austria, Germany, Korea, and Norway.

MINING AND MILLING

Graphite mining is usually confined to the deeply weathered portions of metamorphic deposits and is quite easy and cheap. In the United States there is an annual production of some 5,000-6,000 tons by opencast mining. The ores break easily and only occasional light blasting is required. On the other hand, steeply dipping vein deposits such as occur in Ceylon require underground mining methods involving considerable expense. In Madagascar ore is mined from open pits seldom more than 1,200 ft. deep, using drills, bulldozers and other earthmoving equipment obtained through assistance from the U.S. government. Water, which is often brought from many miles away by ditches and flumes, is caused to flow down the side of the deposit. Workmen standing on the slopes of the pit shovel ore into the flowing water, which not only transports the material to the mill but also helps to break it up, thus serving as the first step in the separation process.

Amorphous graphite that requires concentration is seldom worth mining. Preparation for foundry facings and paints requires grinding only, coarse impurities being removed by screens or separators. Ceylon graphite is hand-sorted into various grades and winnowed to remove fines, which are marketed as dust. Flake graphite from disseminated deposits requires to be concentrated. Since a premium is placed on the grain size, the aim in milling is to free the graphite without destroying the flake size, a requirement which presents difficulties. Graphite floats very readily; hence flotation has become the accepted method for beneficiation of disseminated ores.

The oldest and best-known use of graphite is in making pencils. In fact, the mineral derives its name from a Greek verb which means "to write". The lead in pencils consists of a mixture of graphite, clay and other materials, which are moulded and baked for several hours at temperatures up to 2,000 deg. F. By varying the relative proportions of the constituents the hardness of the "lead" is controllable within wide limits. Either flake or amorphous graphite is suitable for this application.

One of the most important uses is in the manufacture of crucibles for melting metals. The use of crucibles made from Bavarian graphite was mentioned by Agricola in

De Re Metallica, published in 1556. By the middle of the 17th century, however, crucible makers in Europe were using mainly Ceylon graphite. Graphite crucibles used for non-ferrous melting are subject to great thermal shock, because they are used over a period of days and are subjected to changes of temperature from that of the foundry up to as high as 2,700 deg. F. Other refractory articles made from the same type of graphite include crucible covers, pouring nozzles, skimmers, phosphorizers, pyrometer sleeves, annealing boxes, case-hardening containers, and similar equipment.

Commutator brushes are made from natural or artificial graphitic carbon. Ceylon graphite is an indispensable ingredient of the higher qualities of carbon brushes for motors and other electrical equipment such as are used in military aircraft. Substitutes are said to be unsatisfactory because of abrasive impurities and contaminants such as copper and iron.

Nowadays by far the largest use for graphite is foundry facings, the usual practice being to mix this material with sand, clay, talc or mica. All types of finely pulverized amorphous and crystalline grades are suitable for this purpose. Large quantities of amorphous graphite are used to recarburize steel.

Graphite of all types is extensively employed in the production of various forms of lubricants. It adheres readily to metal surfaces and fills the pores, giving a veneer that reduces the bearing coefficient of friction virtually to that of graphite itself. This veneer has the further advantage of being resistant to most chemicals and corrosive reactions. Oilless bearings are made by impregnating wood, copper, bronze or babbitt bearings with a special lubricating mixture containing graphite.

Natural graphite which is sufficiently pure may be used in the manufacture of paints which are of value in the protection of metalwork. Other important applications include graphite electrodes, roofing compounds, fillers for dry batteries, and various forms of steam and pump packing.

For many years Ceylon graphite was the standard for the U.S. crucible industry, although some domestic material was consumed. During the first world war, however, the U.S. was cut off entirely from suppliers of high-grade material in Ceylon and Germany. It thus became necessary to use domestic graphite and clays, with the result that the quality of brass-melting crucibles was seriously impaired. After the war Madagascar flake material became available at low cost and formulae were established that gave longer service life than that previously obtained with Ceylon crystalline graphite. To-day, crucibles have a service life ranging from 30 to 150 heats and even 200 heats in some aluminium alloy tilting furnaces.

During the second world war trading was again dislocated, but both Britain and the U.S. obtained most of their supplies of high-grade crucible graphite from Ceylon and Madagascar. The U.S. produces a portion of its requirements lubricating—and packing—grade graphite, but still imports high-grade amorphous lump and crucible-grade crystalline flake for certain applications from Ceylon and Madagascar respectively. Stockpile objectives for all three grades were either achieved or contracted for in 1953. Exploration projects for crucible-grade graphite are eligible for Government assistance under the Defence Minerals Exploration Programme. The U.K. was the largest user of Ceylon graphite in 1954, its purchases amounting to 48 per cent of the total output against 23 per cent by the United States.

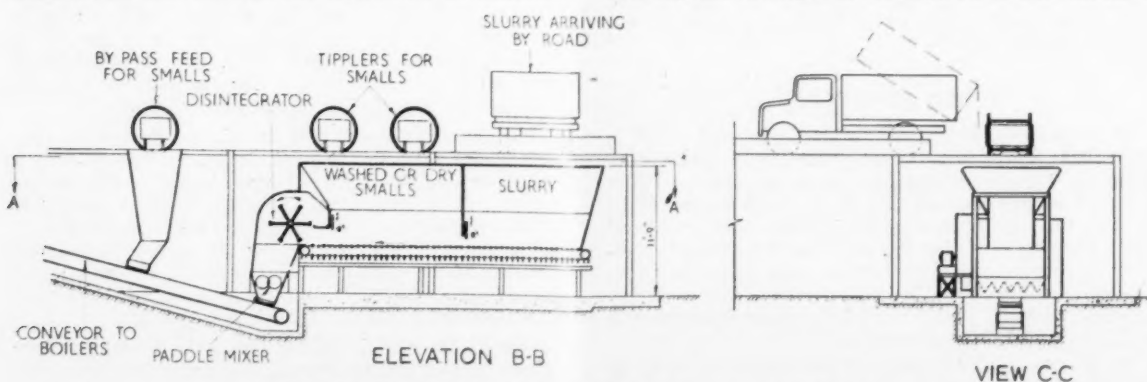
Transporting and Blending Slurry Material

It is generally accepted that slurries cannot be efficiently handled on rubber belts, scraper conveyors or bucket elevators and that the only way they can successfully be withdrawn from stockpiles and wagons is by means of grabs. In the majority of cases, slurries are pumped or otherwise transferred to settling ponds for draining surplus moisture, and grabs can be used for transferring the settled material direct into either boiler bunkers or railway wagons. The problem of moving slurry from bunkers to combustion appliances is, however, more difficult. The following article, condensed from N.C.B. Bulletin 55/156, outlines the best means of transporting slurry material and suggests ways in which it can be conveniently fed, either alone or mixed with other fuels, to combustion appliances. Descriptions are given of fuel blending equipment which has been tried out in the United Kingdom.

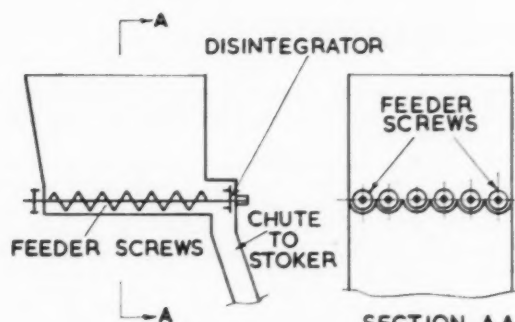
The composition of slurry in a settling pond generally varies considerably over the length, depth and width, and it is therefore difficult to obtain a representative sample from a pond. Slurry can be removed from settling ponds by means of grabs, and experience has shown that standard railway wagons can be used to transport it. Rectangular, bottom-opening containers have been used in the United Kingdom for land sale coal and experiments have shown

that they are suitable for carrying and discharging slurry. Three or four of these containers each holding 3-5 tons of fuel can be loaded on one bogie. The fuel can be transferred from wagons to boilerhouse bunkers either by grabbing out of the wagon or by lifting the containers by telfer and emptying them direct into the bunkers.

Continental discharge practice, especially in Holland and Germany, has developed in two ways. Plants have for some



An Erko blending plant for blending two fuels at 25 tons per hr. capacity



A slurry bunker with feeder mechanism

years been in successful operation in Holland with slurries of a very sticky nature (containing 15 to 25 per cent of ash and 20 to 25 per cent of total moisture and a percentage of fines below 200 mesh of the order of 45 per cent). The bottom of the bunker incorporates a row of screws which carry the slurry forward towards the outlet where cutters located on the shaft of each screw break up the material for discharge into the open chutes of stokers.

In another bunker conveyor mechanism, used in many plants on the Continent, the feed rate is controlled by the thickness of the fuel layer on the conveyor and by the conveyor speed, the thickness of feed being determined by the position of a guillotine door of the kind used in chain grate stokers.

A cylindrical rotating slurry bunker, developed by Babcock and Wilcox, Oberhausen, Germany, has been in use for some two years feeding slurry into a small mill producing pulverized fuel for an experimental Lancashire boiler plant at Newcraighall colliery, Lothians Area, Scottish Division of the National Coal Board.

Rotary slurry bunkers sometimes become sluggish in their discharge, especially when there is a variation in the consistency of the slurry. Usually this is due to the slurry sticking to the side of the revolving shell of the bunker. To remedy this defect a device for freeing the slurry from the shell has been fitted in the bunker at Newcraighall. The shell revolves on four wheels which run on a flat circular rail attached to the main structure of the bunker. A wedge 3 in. long by $\frac{1}{2}$ in. or deeper, at the thick end is fixed to a portion of the rail and, acting as a ramp, produces a slow upward and quick downward motion of the shell as the four wheels run over it in turn as the shell revolves. This action shakes the slurry from the shell side.

NEED FOR CONSISTENCY

The most flexible and adaptable method of handling and burning fuel is by skilled hand firing on a simple stationary grate. However, where mechanical stokers have replaced hand firing the flexibility of the latter method has to be sacrificed. It does not mean that low-grade fuel cannot be burned on stokers, but that stokers cannot be adjusted successfully to rapid changes of fuel and that badly blended fuel affects their operation to a great extent. In order to obtain reasonable efficiencies with modern firing equipment the fuel supplied has to be consistent, and the different sizes comprising the fuel must be reasonably well mixed and not segregated from each other. There are also other requirements with regard to moisture and the ratio maximum to minimum particle size, varying with the type of fuel used.

As a result of studies made in Holland and Germany a type of blending plant much used in these countries has been installed and tried out at Wheatsheaf Colliery, North Western Division. The plant has been used since 1953 for

blending fuel for a range of six chain-grate-stoker fired Lancashire boilers, with a fuel consumption of about 17,000 tons per year. The plant has compartments to deal with two fuels but could be easily altered to deal with three fuels. By adjusting the thickness of the layers of slurry and other fuels, which travel on top of each other on the plate conveyor, the proportion of each to be burned can be precisely adjusted. Spray nozzles have been installed so that moisture can be added while the fuel layers are broken up and fed into a twin paddle mixer. The plant was made in Germany by Maschinenfabrik Besta, Ratingen, and supplied by P.H.I. Engineering Ltd.

At Wheatsheaf a considerable number of different fuels have been blended successfully into a perfectly consistent and homogenous material which did not tend to segregate on its way to the stokers and which burned well. Since the fuel hoppers have steep sides and their bottom outlets are wide the plant has shown itself capable of handling wet fines without bridging or other difficulties.

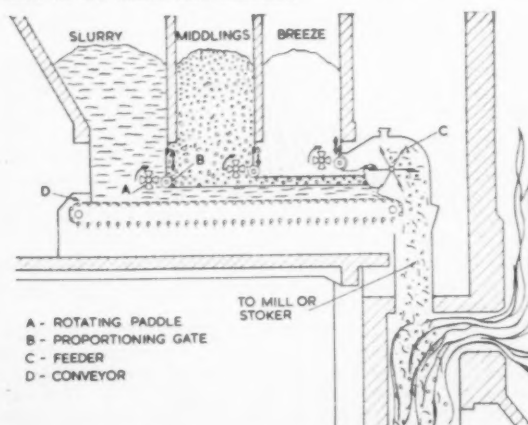
The cost, including erection on prepared foundations, was approximately £7,000, including import duty of about £1,300. It has a capacity of about 25 tons/hr., and the electrical consumption is about 25 units/hr. At Wheatsheaf, the tubs containing the fuel were originally man-handled to the plant and the labour costs were, as a result, high, amounting roughly to 6s. 3d./hr. This is now done mechanically, but even with the previously high labour charge the cost of blending was found to be low.

BLENDING THE FUELS

The percentage of wet fine fuels permissible is often limited by the type of handling plant, the shape of feeding chutes and hoppers and the combustion appliance. The inclusion of 25-40 per cent of wet or dry fines, cleaned or uncleaned, will be possible with many coals, without greatly reducing output and efficiency.

When assessing the quantities of blended fuel required, it can be assumed that with properly instrumented plant, skilled operators and proper supervision the efficiencies obtainable with such blends will be high and there need be no atmospheric pollution by fly-ash.

The economics of blending depend, not only on the efficiencies and the output obtainable but on the prices charged for the low-grade fuels. Where these prices are reasonable they create an incentive for the colliery to accept the complications arising out of the necessity for blending and the greater care required when burning boiler fuels containing much ash and a proportion of fines. When fixing prices for low-grade fuels these complications have to be taken into account.



The Erko feeder-mixer working with a Kramer mill

MACHINERY AND EQUIPMENT

A New Model to Portable Compressor Range

Atlas Copco have introduced a new model to their range of portable compressors. The 250 Monobloc, which gives a free air delivery of 250 cu. ft./minute, is based on actual operating experience gained with their HR4V compressor in different parts of the world under a variety of working and climatic conditions. This machine is built on the monobloc principle with a two-stroke diesel engine having no valves and double-acting compressor of the crosshead type.



The Atlas Copco 250 Monobloc compressor

With the monobloc system, developed by Atlas, engine and compressor are designed for each other; they are integral and not separate units as in conventional designs. The Monobloc unit has one crankshaft, one air intake, one cooling system, one circulating water pump combined with one fan for the engine radiator and the compressor intercooler, one lubrication system with one oil pump, no clutch and no electrical system, no engine valves, valve gear or camshaft, only one gear for force feed lubricating pump.

With the Atlas Copco 250 Monobloc, the two rear wheels are fitted with brake drums actuated by a brake lever on the right side of the machine. By fastening a rope or cable to the lever the brake can be operated while the unit is on tow.

Track width is 58 inches, which gives improved stability over rough ground. It has been found that the 250 Monobloc is well suited for following in the track of large commercial vehicles. The wheel base is 77 inches—giving improved weight distribution. The turning radius is measured on the track of the outer front wheel, with the result that the unit is manoeuvrable on narrow roads and in confined spaces. The fuel oil tank has been made for 30 Imp. gal. which is ample for 10-12 hours operation, eliminating the need to refuel during a working shift.

A Range of Rock Drills

The range of rock drills manufactured by the Consolidated Pneumatic Tool Co. Ltd., is well known in the mining and quarrying industries.

The most powerful drill in the range of C.P. hand-held machines is the Model 59. This unit is in the 55 lb. class and has fast drilling speed with fast rotation. It is available as a wet or dry machine and can be supplied with a Tee-type handle for hand sinking or a closed handle for feedleg operation. Standard chuck size is 1 in. hex. by 4½ in.

The C.P. 32F. drill is in the 45 lb. class, is available wet or dry, and with Tee or closed handle. Standard chuck size is ¾ in. hex. by 3½ in.

A lighter unit is the 35 lb. model C.P. 225, designed for holes up to about 10 ft. depth and is presented as being ideal for block holding in quarries, open cast mining, and for brushing and stone drifting in coal mines. This machine can be used with feedleg for mining operations where conditions favour a lighter duty drill for short hole work. It is available wet or dry at standard chuck size of 7/8 in. hex. by 4½ in.

The smallest drill in the C.P. range is the C.P.-122 Sinker. This model normally has a closed handle and is available as a wet or dry machine.

The C.P. Feedleg is basically the conventional pneumatic support leg. The ample size of the piston, however, overcomes any tendency to whip and, amongst other benefits, is forwarded as imparting greater rigidity at all drilling positions.

These drills were described in an interesting brochure recently issued by the manufacturers.

New Conveyor Belt of Chemical Rubber

A new type of conveyor belt now being introduced commercially features a cover of Hypalon chemical rubber, one of the latest products of the Du Pont Company's research in elastomeric materials, distributed in the U.K. by Durham Raw Materials Ltd. Lifting hot salt from a direct fired rotary drier to storage bins 27 feet above, the new belt has demonstrated outstanding heat resistance by lasting twice as long as the best belting formerly available.

The belt, 57 feet long and equipped with 56 Monel metal buckets operates seven days a week, in a plant in the United States, carrying salt through a sheet-metal enclosure which, while it keeps the salt dry, also maintains temperatures ranging from 150 deg. C. to 260 deg. C.

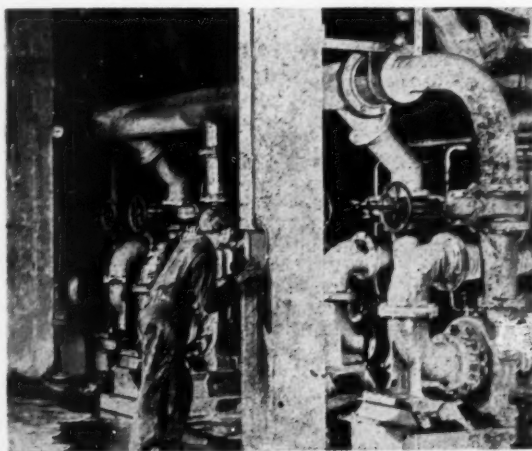
Belts on this operation previously lasted from two to three months at most. The new Hypalon belt lasted more than six months. When the belt finally broke it was because the carcass failed, rather than the cover.

A Communication System in Collieries

The first industrial communication system to be installed in a coal washery in Great Britain was made by The British Thomson-Houston Company, in 1952. Since then B.T.H. has installed this Clearcall system at many N.C.B. collieries, including coal preparation plants at Bradford Colliery, Manchester, Maltby Main, near Doncaster, Westoe, South Shields, and Monkton, near Pelaw.

By speaking into a microphone an operator can be heard by all other personnel on the plant, no relays being used. Remote points such as manager's and foremen's offices are connected into the system so that instructions can be given immediately to all parts of the washery simultaneously.

It has been proved that many of the difficulties associated with the application of electronic communication equipment to such arduous conditions as those encountered in ore handling has been overcome by the use of tropically-treated components.



Clearcall system in pump room at Maltby Main colliery

METALS, MINERALS AND ALLOYS

COPPER.—Copper has remained extremely tight in the United States, with custom smelters getting 52 c. per lb. for February metal although there are only small quantities still unsold; for March metal the custom price is 50½ c. and April is selling at 50 c. per lb. The commercial demand for the metal remains strong and supply is kept tight by a strike at Laurel Hill refinery which has already cost about 9,000 tons. In addition the pre-Christmas strike in Chile is now beginning to have its effect on market supplies. There is as little confidence in the price level in the United States as there is in London's quotations. The prices for March and April metal in the United States are fairly nominal since business in those months is not brisk and fabricators are trying to keep commitments to a minimum. There is certainly no talk of the big producers raising their price of 43 c. per lb. although it has been out of line for some weeks now; when copper from the custom smelters was last fetching 50 c. this was a common talking point. Moreover it is thought that only the firmness of the American market is preventing a sizable fall in London; if this is so the fall in London when it comes is likely to be quite sharp and its effects across the Atlantic correspondingly marked.

The annual review of the British Metal Corporation suggests that the year 1955 is best regarded not as an exceptional year but as a foretaste of the normal. "One is led to ask whether the impact of modern technology and spreading industrialization on the overall demand for copper may not have been vastly underrated. The ubiquitous electrical industry is in the van of industrial development and copper is the main raw material of that industry. May it not be that the 'market' has been wiser than all the paper evaluations and is signposting a many-sided demand for copper in the developing new age of atoms and electronics which will grow faster than it will falter through substitution by other materials." On the whole this seems a fair judgment. Recent speeches from across the Atlantic have concentrated on the fact that expansions of copper output now in hand should take care of the present demand and in this they are right especially if demand in Europe continues to falter. But they have been much less reassuring about the certainty of copper supplies after the next decade. Yet this is the matter which is in doubt. There has been too much emphasis on the fact that copper must not go below 30 c. and too little on the need for much more expansion. No doubt it will be said that these are two sides of the same coin—but it would be nice to see the right side up.

LEAD.—Lead was unchanged in New York at 16 c. per lb. with demand for the metal quite active although demand was concentrated on the nearby weeks. The continuing dock strike in Australia has been enough to outweigh any bearishness arising from the cutback in the automobile industry. The General Services Administration has after all asked for tenders for delivery to the stockpile by March 15. There had been a widespread feeling that the G.S.A. would not seek further supplies for the time being because of the recent paucity of offerings. An official of G.S.A. went out of his way to make it clear that there had been no change of policy.

Deliveries of refined lead to domestic consumers in 1955 were the biggest since 1947; they were 531,339 a sharp increase over 1954's total of 475,552 tons. Lead for batteries rose to 88,461 tons against 66,068 in 1954 primarily because of a big increase in the number of 12 v. batteries made. (This figure helps to explain why lead has so much less than zinc to fear from the automobile cutback). Production of refined lead in December was 50,448 tons against 52,623 in November and the total for the year was down to 547,153 tons against 551,618 in 1954. For the first time in more than a year stocks of lead at refineries were up to 31,089 tons against 28,855 a month earlier. But in this period sales to the market were highly irregular in anticipation of the price rise.

TIN.—Tin has continued to drift gently downward in New York through inactive dealing on a market with a soft undertone; it is now down to 101.37 c. per lb. for spot straits metal. It is true that a halt was called to the drift (which has been in progress for over a fortnight) on news of a threatened strike in Malaya but this was only temporary and the market soon returned to its decline. This is bound to be an unsettled time for tin since the metal will shortly undergo a major transformation marketwise. Nevertheless the recent decline, while never steep, has been unusually long-lived. Nothing that has happened on either side of the Atlantic so far justifies a very bearish view of the immediate consumption trend; the motor industry is not a vast consumer of tin. Furthermore the statistical position has not been stronger since the Korean boom. The recent buying spurt that carried tin to its high levels was dictated by an actual shortage of metal and had little of a re-stock-element.

Unless the industrial outlook seems suddenly and much worse in United States it is unlikely that Americans can continue to buy on their present meagre scale.

Meanwhile a strike threatens in the Malayan tin industry where negotiations have broken down between employers and trade union. The employers have accepted that payment should be made for rest days and that this should be retrospective to December, 1955, but the union wants it to be retrospective to 1954. This was the first item on the agenda and the other items were not reached.

At first the news caused tin to harden in Singapore, London and New York, but this was only temporary and prices have tended to continue their decline. The Malayan Mining Employees Union is to call two meetings to discuss the breakdown of negotiations on February 26 at Kuala Lumpur and on March 4 at Ipoh. Although strike ballot papers will be available at these meetings if needed, it is clear that there is still considered time to settle the dispute. Mr. Caddick, British appointed Trade Union member has appealed to both sides to submit to arbitration. It is understood that the employers are hopeful that the dispute will not produce a strike, and it is clear that the market thinks likewise. However, even if this dispute is settled, there is the possibility of a strike of government employees who are now taking a ballot on the matter. The government has refused to take the pay dispute to arbitration.

In Indonesia, a second reading of the Bill to ratify the International Tin Agreement was taken on January 26 (a day late) and was not completed. In the course of the debate the communists asked for information on a report that countries of Eastern Europe were not given free access to tin supplies. The debate was then adjourned. Subsequently, however, approval was given to the ratification and once the signature is deposited in London the International Tin Council can be convened within 30 days.

There have been recent reports of a *rapprochement* between communists and the nationalists and this movement has been given public support by the president Mr. Sukarno. It is still not certain that the communists will enter the next government but their chances of doing so are now much brighter than they were before Christmas. Furthermore it may well be that some agreement might be reached for the sale of tin to Russia and Eastern Europe that might make the I.T.A. less attractive again. It would require smelting the concentrates in the east but that might not be impossible. Some such move would certainly not be beyond Russia's devising in her present trade negotiations.

A new demand for more development work in Malaya was made by Mr. Patterson, chief inspector of mines, who said that the present position was one of grave concern. He suggested the possibility of evacuating the mining camps of Kampong, Kepayang, Tambun, Siputeh, Jelapang, Lahat, and others all near Ipoh so as to mine the ore beneath them. He considered that the record output of 61,244 tons of 1955 would be improved on this year.

ZINC.—Zinc has been fairly quiet in the United States although the price of 13.50 c. per lb. for prime western grade at East St. Louis has remained well established. It is understood there has been a marked falling off in the demand for special high grade zinc. This is inevitable since the bulk of high-grade zinc is used in die-casting for the automobile industry. Last year when the automobile boom was at its peak, the premium for this grade of metal was raised; if demand for zinc falls unevenly, i.e., if the present recession affects no more than automobile production, then the premium might well have to be narrowed down. The G.S.A., in spite of speculation to the contrary, entered the market for fresh supplies of zinc and it is understood that something like 2,000 tons of prime Western grade were taken up. Tonnage-wise this is only a small rise in offerings, but percentage-wise it is quite considerable.

The Metal Mining Industry Association of Japan is to send an inspection team of five members to Bolivia. The team will look primarily for lead and zinc ores. Thereafter it will go on to other South American countries.

It is understood from Reuter that all the American metal traders and producers are now basing export prices for lead and zinc on the levels prevailing on the London Metal Exchange, and are no longer quoting f.a.s. Gulf lead and zinc prices.

ALUMINIUM.—Aluminium, like Alexander, is continually in search of new fields to conquer and its horizons are steadily widening. Porcelain enamelled aluminium, already popular in the architectural and appliance fields, has taken a big step forward with the development by Alcoa of a time-and-cost-

cutting pre-enamelling process. Mr. Robert B. McKee, vice-president of Alcoa, believes that the aluminium industry, which spent more than a billion dollars on plant expansion in the past decade, will spend much more in the next ten years. He predicted that business would continue to be good, basing his forecast on population growth and the creation of new industries. Citing the use of aluminium in building as an example, he pointed out that it had grown from practically nothing 10 years ago to 20,000 tons of aluminium annually. "Alcoa's architectural department wants to build an all-aluminium house," he added. "While this may not at present be practicable, it could certainly lead to very interesting developments."

In Canada the tight supply situation has led to a sharp increase in the production of secondary aluminium ingots, which are evidently being used as a substitute for primary metal. Nevertheless experts in the trade do not anticipate any new controls on the movement of aluminium scrap. The shortage of primary metal has led to suggestions that Alcan might be giving priority to orders from export customers to those from domestic consumers, but this has been categorically denied by the company.

MICA.—High quality natural mica is at present the only known material satisfactory for use in essential electronic products, such as tubes and capacitors. It has always been in scarce supply. *Reuter* reports from Washington that the Office of Defence Mobilization (ODM) has announced an expansion of goals for additional output of substitutes for "highly strategic" muscovite block and film mica. The revised target calls for mica or alternative materials in sufficient quantity to replace the 1,000 tons of natural high-grade mica used annually for strategic purposes.

PLATINUM.—The demand for platinum is well in excess of current supply and it is anticipated that it will remain so for the greater part of 1956. The chief factors responsible for the present tight situation are the high level of demand from the chemical and glass industries and the growing use of platinum as a catalyst in petroleum refining. The other platinum metals are approximately in balance between supply and demand. Johnson, Matthey and Mond Nickel continue to sell platinum at £32 10s., but up to £42 has been paid for such small quantities as have been available from other sources. Production is being expanded as rapidly as possible. A further £2,250,000 is being spent on further extensions to Rustenburg Platinum Mines, which will be spread over the next two years. The benefits should begin to be felt about the end of 1956 in the form of increased supplies from this source.

TITANIUM.—U.S. production of titanium sponge amounted last year to 7,200 s.tons representing a gain of about 34 per cent over the 1954 output, which was more than double the 1953 figure of 2,241 tons. As previously reported in this column, Government assistance for the creation of additional titanium sponge capacity was suspended by O.D.M. on September 12, 1955, supply having overtaken demand. In making this announcement, however, it was stated that the programme was to be kept under continuous review. Existing contracts already in existence call for an annual titanium output of 21,600 s.tons in 1957.

At a time when titanium appeared to be making increasing headway, complaints of inadequate quality, lack of consistency, and processing difficulties were made by several aircraft firms. Particularly encouraging, therefore, is a statement by the U.S. Bureau of Mines that last year improved metallurgical techniques in the titanium metal industry resulted in the manufacture of titanium sponge of higher quality, besides permitting substantial reductions in the prices of sponge metal and titanium mill products. At this stage in titanium's history these gains are of even greater importance than the impressive expansion of tonnage capacity which has again been achieved.

The London Metal Market

(From Our Metal Exchange Correspondent)

With no news about the possible settlement of the Phelps Dodge strike copper has remained a firm market, and in America the nearby position has grown tighter resulting in higher quotations and a better price being bid by customs smelters for scrap. Consumers on this side of the Atlantic are becoming more used to a price of around £400 per ton, and the longer this level is maintained the more difficult it is to visualise a falling market within the next few months. With Metal Exchange stocks showing a small decline last Monday the backwardation has remained at a level which many people consider to be too high for the good of the market.

The main feature of the tin market has been its weakness in face of rumours of a strike in Malaya, and this seems to show

that only a minority expects serious trouble but minorities are sometimes wrong. The other piece of news which has had no direct impact on the price is that Indonesia has at last ratified the Tin Agreement, and this now comes into force: it will be interesting to follow further developments, as with the price well above the buying range there may be difficulties in getting the scheme to work. On Wednesday morning the Eastern price was equivalent to £778 5s. per ton c.i.f. Europe.

Although there has been no good news about the Australian dockers' strike, both the lead and zinc markets have tended to give ground but with the backwardation showing signs of increasing. If the dock strike does continue for even another week it must have serious repercussions on the flow of metal, which may cause the backwardations to widen further even if other considerations keep the price level constant. In America it is understood that only small tonnages of the metals were tendered to the Government for their monthly purchase, and a number of people are surprised that more was not offered in view of the cut-back in the motor car production. On the Continent both lead and zinc are difficult to buy for delivery during the first-quarter unless premiums are paid over the current price.

Closing prices and turnovers are given in the following table:—

	January 26		February 1	
	Buyers	Sellers	Buyers	Sellers
Copper				
Cash	£390	£391	£398	£399
Three months	£374	£375	£381	£382
Settlement		£391		£399
Week's turnover		5,050 tons		3,025 tons
Tin				
Cash	£784	£785	£786	£788
Three months	£776	£777	£772	£773
Settlement		£785		£788
Week's turnover		730 tons		715 tons
Lead				
Current half month	£1174	£1184	£117	£1174
Three months	£115	£115½	£114½	£114½
Week's turnover		6,725 tons		6,100 tons
Zinc				
Current half month	£1004	£1004	£994	£100
Three months	£964	£97	£954	£964
Week's turnover		5,900 tons		3,675 tons

OTHER LONDON PRICES—FEBRUARY 2

METALS

Aluminium, 99.5%, £179 per ton	Nickel, 99.5% (home trade) £519 per ton
Antimony—	Osmium, £24/27 oz. nom.
English (99%) delivered, 10 cwt. and over £210 per ton	Osmiridium, nom.
Crude (70%) £200 per ton	Palladium, £8 0s./£8 10s. oz.
Ore (60% basis) 23s. 6d./24s. 6d. nom. per unit, c.i.f.	Platinum U.K. and Empire Refined £32 10s. oz. Imported £39 0s./£41 0s. oz.
Bismuth (min. 1 ton lots) 16s. lb. nom.	Rhodium, £40/£42.
Cadmium 12s. 0d. lb.	Ruthenium, £16/£18 oz.
Chromium, 6s. 11d./7s. 4d. lb.	Quicksilver, £87 10s./£88 ex-warehouse
Cobalt, 21s. lb.	Selenium, 72s. nom. per lb.
Gold, 249s. 3½d.	Silver, 76½d. f.o.z. spot and 76½d. f.d.*
Iridium, £29/31 oz.	Tellurium, 15s./16s. lb.
Manganese Metal (96%-98%) £269 according to quantity	
Magnesium, 2s. 4d. lb.	

ORES, ALLOYS, ETC.

Bismuth	50% 7s. 3d. c.i.f.
Chrome Ore—	30% 5s. 0d. lb. c.i.f.
Rhodesian Metallurgical (semi-friable) 48% ..	£15 2s. 6d. per ton c.i.f.
Refractory 45% ..	£14 2s. 6d. per ton c.i.f.
Smalls 42% ..	£12 2s. 6d. per ton c.i.f.
Magnesite, ground calcined ..	£27-£28 d/d
Magnesite, Raw ..	£11-£12 d/d
Molybdenite (85% basis) ..	8s. 2½d. nom. per lb. c.i.f.
Wolfram and Scheelite (65%) ..	260s. 0d./265s. 0d. c.i.f.
Tungsten Metal Powder (98% Min. W.) ..	21s. 1d. nom. per lb. (home)
Ferro-tungsten (80%-85%) ..	18s. 1d. nom. per lb. (home)
Carbide, 4-cwt. lots ..	£39 3s. 9d. d/d per ton
Ferro-manganese, home ..	£59 10s. 0d. per ton
Manganese Ore Indian c.i.f. Europe (92%-97%) basis 110s. freight ..	90d./95d. per unit c.i.f.
Manganese Ore (82%-87%) ..	80d./85d. per unit c.i.f.
Manganese Ore (67%-70%) ..	65d./68d. per unit
Brass Wire ..	3s. 7½d. per lb. basis
Brass Tubes, solid drawn ..	3s. 0½d. per lb. basis

* Price on February 1.

COMPANY SHORTS

Dull Week for Stock Markets.—Although the past week witnessed an improvement in Wall Street's Dow Jones Industrial Index to 473.28 on Wednesday from 467.56 on Monday due to good corporate results outweighing political uncertainties and fears of further automobile cutbacks, the better feeling did not find its way across the Atlantic. Conditions in the London Stock Exchange were, in fact, extremely dull, especially as a new account opened on Wednesday.

Throughout the week Kaffirs attracted little support, reflecting a lack of interest in Johannesburg and reluctance of U.K. investors to take present adverse industrial portents seriously enough to warrant a switch into gold. There were, however, one or two interesting features amongst which the Winkelhaak flotation figured prominently. Bidding for these new shares initially established a price of around 15s. 4d. which later settled down around 15s. 3d. Reflecting news of the application for mining lease by Van Riebeeck Mines to exploit a section of the Van Den Heeverstrust area in the O.F.S., Middle Wits, and Geoffries at first showed some improvement, but this was not maintained. A good spot was the 10s. jump in New Pioneers to 15s. on take over rumours.

Moving against the generally dull trend, coppers and base metals showed some small gains during the latter part of the week. R.S.T. put on about 2s. to 48s. in anticipation of the Mufulira quarterly, while Nchanga, Rho-Anglo and Chartered were all better. Rho-Kats advanced to 31s. 9d. News of Fresnillo's expansion plans hardened these shares to £3½. Broken Hill South also advanced 1s. to 57s. Eastern Tin issues showed few improvements. Indonesia's ratification of the International Tin Agreement caused little change at first, although it was thought in some quarters that the removal of this uncertainty might put the market better.

F.S. Geduld's Maiden Profit of £20,000.—The feature of the Rand and O.F.S. returns for January—based on a gold price of 248s. 8d. against 249s. in December—was the first monthly production and working profit figures from Free State Geduld. During January 33,000 tons were treated yielding 10,801 oz., equivalent to 6.55 dwt. gold per ton milled. Working costs at 69s. 7d. per ton were not unduly high for the initial crushing and the working profits of £20,168 was up to expectations.

Elsewhere, the biggest improvements over the December results were reported by Blyvoors whose profits expanded some £43,000 to £410,600, and by West Driefontein whose profits advanced by £38,000 to £468,700. Harmony, St. Helena, Presidents Brand and Steyn, and Welkom, all showed better results.

Anglo's Progress in the O.F.S.—At the recent meetings of Anglo American Corporation's O.F.S. mines Mr. Harry Oppenheimer was able to disclose information regarding development which had taken place since the publication of the December quarterly reports up until January 20, 1956.

At Free State Geduld, development to the S.E. No. 2 shaft in Haulage 43 had been maintained at a satisfactory rate in an area relatively free from faulting and water. A connection with the Western Holdings haulage north could be expected about the end of June. At the property's No. 1 shaft area, the high value of 893 in. dwt. had been obtained from 201 ft. sampled, all of which was payable. At No. 2 shaft 100 ft., all of which proved payable, gave 1,020 in. dwt. Underground development at Welkom had continued to give satisfactory results, particularly to the South and East of No. 2 shaft. A total of 980 ft. had been sampled giving 94 per cent payability and averaging 509 in. dwt. Development continued to show improved uranium values. Mr. Oppenheimer stated that profits from this source in due course were very probable. At President Steyn opening up of the Leader Reef had been continued because of its satisfactory uranium value. Development on the basal reef had given 95 per cent payability and 522 in. dwt.. President Brand had continued with its recent recovery in values reporting 1,042 in. dwt. and 88 per cent payability. Development of the "B" reef at Lorraine had averaged 733 in. dwt. and 47 per cent payability. The opening up of this reef by disclosing high values in relation to those of the basal reef, provides an encouraging factor for this mine's prospects. No further information was given as to whether the company would become an uranium producer or not. Since the end of the December quarter development operations at Western Holdings had been very satisfactory in both shaft areas. Payability was 88½ per cent, and values averaged 877 in. dwt.

Riebeeck Gold Formed to Exploit VDH Area.—Agreement has been reached between Middle Witwatersrand (Western Areas) and General Exploration Orange Free State for the formation of the company to be known as Riebeeck Gold Min-

ing Company. This company, which will be under the administration of Anglo-Transvaal Consolidated Investment, will make application for a mining lease in respect of farms Van den Heeverstrust 410, Klien Begin III, and portions of farms Welgevonden 183, Weltevreden 205, Spes Bona 210 (including Tevrede), Rosedale 298 and Britzpan 228 in the district of Odendaalsrus, Orange Free State. Details of the scheme will be submitted for approval at an extraordinary general meeting, notice of which will be issued shortly.

Redemption of Harmony's 6 Per Cent Notes.—Notice has been given by the Harmony Gold Mining Company that on April 30, 1956, the whole of its 6 per cent Registered Unsecured Convertible Notes not converted or surrendered for conversion by December 31, 1955) will be redeemed at par plus accrued interest to that date. Cheques in payment will be posted on April 30, 1956, to noteholders' last registered addresses or in accordance with their written instructions. Arrangements have been made with the Johannesburg and London Stock Exchanges for listing and or dealing to cease on April 13 and April 16 respectively.

Amits Increases Dividend.—With the declaration of a final dividend totalling 15s. per share including bonus of 5s. by Anglo American Investment Trust in respect of the year ended December 31, 1955, total distribution has been raised to 20s. per share. During the previous year payments amounted to 15s. (including 3s. bonus). Estimated profits for the past financial year, after taxation, rose sharply to £3,085,000 from the previous level of £2,731,590.

Writs Maintains Dividend.—With a final dividend declaration of 1s. per share in respect of the year ended December 31, 1955, West Rand Investment Trust has maintained at 1s. 9d. per share its total distribution at the previous year's level. Subject to final audit, the past financial year's profits after taxation declined to £823,000 from £941,210.

Dominion Reef's Profits Up.—In last week's issue of *The Mining Journal*, page 131, details were given of operations carried out by Dominion Reefs (Klerksdorp) during the quarter ended December 31, 1955. As some errors inadvertently appeared in these figures we are again itemizing the salient points. Tonnage treated ex dump rose to 144,000 tons from 132,870 tons during the preceding quarter. Estimated net revenue from uranium moved up to £243,272 from £224,587. In spite of these good results the company's 5s. shares receded to around 21s. 9d. as compared with a high point of about 39s. in 1955.

An Industrial Survey of The Katanga.—The Comité Spécial du Katanga has published a comprehensive illustrated survey of mining and ancillary interests in the Katanga area of the Belgian Congo in respect of the year 1954. While giving a considerable amount of financial information relating to companies operating in this territory, the report covers the many interesting developments in mining and other projects which have been undertaken since the war. In recent years, very considerable work has taken place with the object of establishing the extent of the territory's natural resources. These include not only mineral deposits but vast forests and agricultural land. Besides outlining the prospecting, geological and geographical work, which has thus been entailed, the report covers many other none-the-less essential aspects of development such as housing, medical and social services. For those interested in the great and expanding enterprises of the Katanga, the Comité Spécial's report provides one of the most authoritative surveys available.

Winkelhaak Issue Result.—It has been announced by Union Corporation, sponsors of Winkelhaak Mines—the new Far Eastern Rand property—that of 1,750,000 ordinary shares recently offered for sale at 15s. per share applications were received for 729,100 shares. Dealings in the "Winkels" shares started on January 31 at a price of around 15s. 3d.

Tekka-Taiping Now Proposes Return of 5s. Per Share.—An extraordinary meeting of Tekka-Taiping has been called for February 20 to consider returning 5s. per £1 share to holders.

AGENCE MINIÈRE ET MARITIME S A

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JOS TIN AREA (NIGERIA) LTD.

SATISFACTORY RESULTS

The 45th ordinary general meeting of Jos Tin Area (Nigeria) Ltd., was held on February 1 in London, Mr. A. B. D. Fox, A.R.C.S. (the chairman) presiding.

The following is an extract from his circulated statement:—

The amount of tin concentrate sold for the year was 147 tons as compared with 145 tons in the previous year. Production costs continue to rise, the Native wages alone accounting for an increase of £23 per ton. However, the average price for our concentrate was £513 per ton as compared with £482 last year, tin metal during our financial year having averaged £721 as compared with £685 in the previous twelve months. The gross income received from our investments, namely £27,000 showed an increase of over £4,000 as compared with last year. As a result, the profits for the year enable us to recommend the same dividend as before, namely 20% on an increased capital.

Our production of Columbite continues on a small scale. Sales for the year exceeded the year's production and were accelerated in view of the announced cessation of the U.S.A. Stock Pile bonus. Since the U.S.A. Government ceased buying for Stock Pile, a collapse in the Market price has resulted making it difficult to effect sales at an economic figure.

CAREFUL AND SUCCESSFUL WORKING

You may remember the many warnings given in the past as to the exhaustion of our properties and prospects of declining production. The fact that the rate of decline has been more gradual than expected is the result of careful and successful working. We shall continue to do everything possible to work our remaining ground efficiently and we can hope that, given a satisfactory price for our concentrates, the inevitable further contraction in outputs may not be such as to make our areas uneconomic. But it must not be thought that past warnings were without justification or that there has been any change in long-term prospects.

It was expected that the International Tin Agreement would have been in force before this but its ratification by Indonesia is still required before it can take effect.

It will be seen from the Directors' Report and the Notice calling the Meeting that it is proposed to increase the capital by £40,000 to £150,000 and to issue to the stockholders one share for every five stock units held, representing approximately the balance of income retained in the business and not in the past specifically ear-marked for reserves. The new shares will be identical with the existing stock but will not be entitled to any dividend for the financial year to July 31, 1955. It should not be assumed that any further distribution of this nature can be expected in future nor are there any implications as to the maintenance of the present rate of dividend.

The Company's quoted investments as at July 31, 1955, were £270,189 with a market value at that date of £524,593. Since then there has been a considerable set back in Stock Markets generally, reflected, at the end of November in a decline of approximately 11% in the value of the holdings.

It is my present intention to pay another visit to Jos in February so as to keep in touch and to study the position with Mr. Roberts on the spot.

The satisfactory results we are able to show could not have been achieved without the loyal co-operation of management and staff both in London and Nigeria and our thanks are due to all concerned.

The report and accounts were adopted and the resolutions for the capitalization of profits were approved.

AUSTRALIA—UNIVERSITY OF QUEENSLAND

Applications are invited for the position of **LECTURER IN MINING ENGINEERING**. Applicants must possess a degree in Mining Engineering (or its equivalent) from a University or University School of Mines and must have had either operating or research experience in Ore or Mineral Dressing to qualify them to conduct lectures, laboratory work and research in that subject.

SALARY £A1,300/£A1,750 p.a.

Further particulars and information as to the method of application are obtainable from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1

Applications close, in Australia and London, on **March 31, 1956.**

JOHN SUMMERS & SONS

GRATIFYING IMPROVEMENT IN RESULTS

The annual general meeting of John Summers and Sons, Ltd., will be held on February 22 in London.

The following are extracts from the statement by the Chairman, Mr. Richard F. Summers, which has been circulated with the report and accounts for the year to October 1, 1955:—

The year has been one of intense activity in the steel industry, and, in spite of a substantial increase in the total output, it has been impossible in many cases for the industry to meet the demands put upon it, with the result that considerable tonnages of steel have had to be imported from other countries. There is, however, nothing new in this; this country has for many years been an importer of steel—chiefly in the semi-finished form—while at the same time the export of steel products has played an important part in the Nation's economy, and it would, I think, be unfortunate if exports were further curtailed, as this might well endanger the industry's future position in its traditional foreign markets. Everything seems to point to a further expansion in demand, and the question of finding ways and means of satisfying it has been occupying the minds of the leaders of the industry.

SHEET SECTION

In the sheet section of the industry, which is our main interest, the excess of demand over supply has been particularly heavy. There is no doubt that the higher standard of living throughout the world has greatly increased the demand for many commodities whose manufacture requires steel sheets, such as refrigerators, washing machines, electric and gas cookers, kitchen equipment and, of course, motor vehicles. On the industrial side perhaps the largest increase in the demand for sheet steel and strip has been brought about by the greatly increased production and consumption of oil, which in its turn has kept the demand for drums and other metal containers at a very high level. It has always been our policy to try to distribute our products as fairly as possible between the various industries who rely upon us for their raw material, and it is surprising what a large and varied field they now cover. As a consequence of this policy a temporary recession in any one of these industries does not have a serious effect on our overall position.

POST-WAR DEVELOPMENT

So far as this Company is concerned I think we can legitimately claim to have played our full part in the development which has taken place since the war in the steel industry. We started planning as soon as possible after the end of hostilities, and have now just finished the first and largest of our schemes.

This has resulted in a complete transformation of the Shotton works, making them an up-to-date wholly integrated unit, from which we should shortly be in a position to produce crude steel at the rate of 1,250,000 tons per annum. We shall also have the necessary coke and pig iron capacity behind this production of steel, and mills capable of rolling it into finished sheets and plates.

Last year I stated that the capacity for the manufacture of pig iron was going to be greater than our original forecast, and that, in view of the increased demand, we were investigating the possibility of increasing our target of 1,250,000 tons of crude steel. After going into the position very thoroughly we are now satisfied that we can further raise our steel output to 1,600,000 or 1,700,000 tons.

IMPROVED RESULTS

The improvement in our results is gratifying, as it confirms our early belief that the very large expansion in our plant and the heavy cost involved would in fact be amply justified. The major increase in profits arises from the Parent Company, and has been brought about by favourable trading conditions, by increased production and by better operating efficiency.

The Subsidiary Companies have also contributed their share, and I am glad to be able to tell you that our main Subsidiary, Shelton Iron, Steel and Coal Company, Limited, at Stoke-on-Trent, has had a most successful year, although unfortunately it has not been possible entirely to satisfy the demands of all its valued customers. The demand for bricks (the product of our Subsidiary, The Castle Fire Brick Company, Limited, of Northop, Flintshire) has not been at quite such a high level in the North Wales area as in previous years, but our various brick works have maintained their position.

Owing to a number of unique advantages which we are so fortunate as to possess I have great faith in the future prospects of the Company, but I trust that Shareholders will not expect too much in the way of higher dividends during the period of rapid expansion.

MINING MISCELLANY

A company which has been searching for radioactive ores about 35 miles north-west of Gatooma, has provisionally applied for exclusive rights in the area. Aircraft were used in the search. An official of the Southern Rhodesia Mines Department stated that the area comprised two tracts of land, covering about 88 square miles. Provisional application has been made by the same company for prospecting rights on about 30 sq miles, 30 miles north-west of Sinoia. This area is believed to contain large deposits of copper. Another concern, the Rhodesia Mica Company, is interested in a stretch of land along the Zambesi, about 70 miles north-west of Chirundu.

The United Kingdom Metal Mining Association has put forward its objectives to the Board of Trade. Among them are the establishment of a tax atmosphere for the U.K. non-ferrous metal mining industry "at least as favourable, particularly where the early stages of mining ventures are concerned, as already exists in other countries in the Commonwealth." Among the Association's members are many of the Commonwealth's leading mining concerns.

Better coal than any previously proved in Northern Rhodesia has been found at Kandahwe in the Gwembe Valley, 35 miles south of Choma. Although not as good as Wankie coal, recent tests carried out overseas proved better than was hoped. Boreholes show that the seam varies in thickness from 9 to 25 ft., although all of it would not be usable. The exact extent of the Kandahwe coalfield is not yet known.

Australasian Oil Exploration Ltd. announces that it has obtained beach mining interests in Queensland covering 20 miles of beaches and 40 miles of sand dunes. Preliminary test holes on all the beaches have revealed the presence of payable pockets of rutile-bearing sands.

Rye Park Scheelite is expanding output of rutile from its Laurietown lease. Annual production rate of the property, which covers 1,000 acres in which 22,000 tons of rutile has been proved so far, had been estimated at 2,500 to 3,000 tons annually. On the basis of present performance, however, it is expected that production will rise to 5,000 tons annually.

Dr. Rizk, general manager of the Egyptian Iron and Steel Company, announced that the plant now being built near Helwan is scheduled to begin working in July, 1957, and to go into full production three months later. Its initial annual output will be 220,000 tons, about two-thirds of the country's present requirements. Visible deposits of iron ore at Aswan, Kousseir and Baharia Oasis are claimed to be sufficient for the next 60 years and prospecting for further deposits is in progress. The whole project will cost about £16,000,000.

A Banking and Currency Subcommittee of the U.S. Senate, headed by Senator Douglas, held its first hearing on January 10 on a bill introduced by Senator Green, which seeks to repeal the law under which the Government accepts newly-mined domestic silver at a seigniorage charge of 30 per cent of the \$1.29 coinage price. Opponents of the measure stated that it would provide no benefit to the silver consuming industry with the world price of silver (91 c.) above that paid to domestic producers by the Treasury (90.5 c.) and that if the proposed Bill was enacted many mines would be closed down.

The time appears close at hand, reports *The Northern Miner*, for tapping huge low grade deposits in the Ungava country of far northern Quebec. Backed by the driving force and financial resources of Cyrus T. Eaton, International Iron Ores Ltd. and Atlantic Iron Ore Ltd. are moving closer to the production stage. Expenditures running to several million dollars are proposed this year. They include construction of a large airport near a projected hydro-electric power site on the Payne River, where a potential of 1,000,000 horsepower is readily available. It is understood that tentative markets have already been lined up with the Krupp interests in Germany.

Indian Lake Mines Limited are about to drill a very promising property in the rich copper mining area of Opemiska-Chibougamau, Quebec. Officials of the company state that one of the largest and strongest anomalies ever reported in Canada has been outlined in magnetometer and resistivity surveys of the holding. It is associated with proved surface occurrences of sulphides, carrying ore-grade values in copper, lead and zinc. The company's new holding is strategically located about one mile east of Opemiska Copper Mines' producing copper mine. In view of the geological similarity of the two properties, the

chances of locating ore on Indian Lake's holding are regarded as highly encouraging.

Revised mining laws, passed late in December by the Mexican legislature, will provide a stimulus for large and small miners, the greater benefits being received by the latter group. For operators of small mines, the new basis for tax rebates has been broadened from 200,000 pesos (U.S. \$16,000 to 250,000 pesos (U.S. \$20,000). Tax concessions granted the larger companies take the form of "convenios fiscales," or "special financial arrangements." Situations which may apply in receiving the concessions include: working of low-grade deposits, mining where natural conditions impose high costs, conducting exploration where reserves are dwindling, keeping marginal mines operating, and renovation of equipment where the operator cannot afford the cost.

Resumption of mercury ore mining in the Austrian province of Carinthia is reported to be under consideration. An ore deposit estimated to contain some 2,000,000 tons, located in the Drau River Valley, would be exploited first. Cost of re-opening the mines—experimentally operated during the war—and of erecting a small refining plant is estimated at about £200,000. Occurrences of mercury ore have also been discovered near Eisenkappel in southern Carinthia and near Feistritz and Fefernitz. They are believed to be linked with the well-known Idrian deposits.

A Soviet economic delegation arrived in Kabul on January 24 to discuss credits to the value of £35,700,000 sterling given to Afghanistan by the Soviet Union and to conclude an agreement. Provisions of Afghanistan's first five-year plan, to which the Soviet aid is expected to be directed, will include industrial development and exploitation of mineral resources.

A development programme costing about 100,000,000 West Indian dollars, broadly framed on the recommendations of an International Bank mission, is now under consideration in British Guiana. It is expected to be carried out by the end of 1960. Pending approval of the programme as a whole, the Secretary of State has agreed that funds be made available for financing the reconstruction of a 60-mile road on the east coast, and an additional 2,000,000 West Indian dollars be provided to increase the capital of the British Guiana Credit Corporation.

PERSONAL

Sir Hubert Stanley Houldsworth, chairman, National Coal Board, died on February 1.

Mr. Chester Beatty has had an attack of poliomyelitis from which he is making a satisfactory recovery. He is expected to leave hospital shortly.

Sir Mark Turner has been appointed a director of Tanganyika Concessions in place of Mr. Harry B. Lake, who has resigned.

Mr. Robert M. Whitaker, of Collingdale, Pa., has been appointed comptroller of the Beryllium Corporation.

Mr. G. L. Harrison, A.I.M., has joined the Mond Nickel Company Ltd. He succeeds Mr. A. D. Busby as a development metallurgist in London, where he will be working the cast iron field. Mr. P. D. Wilmott, B.Sc., will join the same company on March 1 as a development chemist.

Mr. A. R. Neelands, chairman of the Cementation Company, is at present in South Africa on a visit to the group's African subsidiaries.

Mr. D. C. Irish, chairman of the Local Board for South Africa, has been appointed a director of Klerksdorp Consolidated Goldfields Limited.

Five delegates from England are attending a three-day conference at Columbia University, New York, on fatigue of metals in aircraft. The conference began on January 30.

Mr. James J. Wadsworth, deputy U.S. delegate to the United Nations, is to represent the U.S. in U.N. negotiations for implementing President Eisenhower's Atoms for Peace proposal for an International Atomic Energy Agency. Representatives of 12 nations will meet in Washington on February 27 to draft a statute for the proposed agency.

A group of Canadian businessmen arrived at London Airport on Sunday morning (January 29). During their stay in this country they will visit the Waterside Works of Ransomes and Rapier Limited at Ipswich. Their main purpose in coming is to see for themselves heavy excavating machinery both under construction and at work on various sites.

The party includes Mr. Percival Streeter, a member of the Dominion Coal Board and President and General Manager of the Avon Coal Company; Mr. Lawson Riggs, manager of the Brunswick Mining and Smelting Corporation; Mr. Burton Colter, Vice-President of the Diamond Construction Co. Ltd., one of the largest contracting companies in the Atlantic Provinces; Mr. Alexander Tooke, Mine Manager of the Miramichi Lumber Co., an important coal producing concern in New Brunswick; Mr. Percival Minue, Engineer-in-Chief of the Department of Public Works, New Brunswick Government; Mr. Aubrey Wasson, President of A. W. Wasson Ltd., coal operators and road contractors; and Mr. A. Lee-White, director of Gill and Co., Ltd., of St. John, New Brunswick.

After leaving Waterside Works, the Canadian party will visit the opencast iron ore mines in Northamptonshire where they will see the Rapier W1400 Walking Dragline—the largest in the world—stripping 30 tons of overburden from a depth of 100 ft. with each bite of its 20 cu. yd. bucket. While in this area the Canadian party will visit several other opencast mining sites where they will see many types of Rapier Excavators and Walking Draglines in operation. They will then go on to Yorkshire where they will see similar equipment working on opencast coal production.

CONTRACTS AND TENDERS

India.—TEN/17659, light alloy sheets. Closing date, 14/2/56. B.O.T. Ref.: ESB/2004/56. Telephone enquiries to Chancery 4411. Extension 738 or 771.

The International Co-operation Administration recently announced the following future authorizations:

	Contract Period	Terminal Delivery Date	Amount (in U.S. dollars)
<i>Philippines</i>			
Irrigation pump equip. (PIO/C No. 92-12-044-9-50208)	7/12/55		
Iron and steel mill materials	31/5/56	31/5/57	175,000
Engines and turbines			\$15,000
Construction, mining & conveying equip.			\$63,000
			\$97,000

India

Equipment for Industrial Research and Technical Services

Organisation: (PIO/C No. 28/11/55 86-27-026-9-41150)	30/6/56	31/10/56	146,000
Construction, mining and conveying equip.			\$34,900
Generators and motors			\$10,000

Pakistan

Nickel and nickel base alloys and nickel products (PA No. 91-695-A6-6227)	20/12/55	31/5/56	31/8/56	13,800
Non-ferrous ores and concentrates (PA No. 91-650-A6 6226)	20/12/55	31/5/56	31/8/56	10,000
B.O.T. Ref E.S.B./1211/56/I.C.A. Telephone enquiries to CHAncery 4411, Extension 360.				

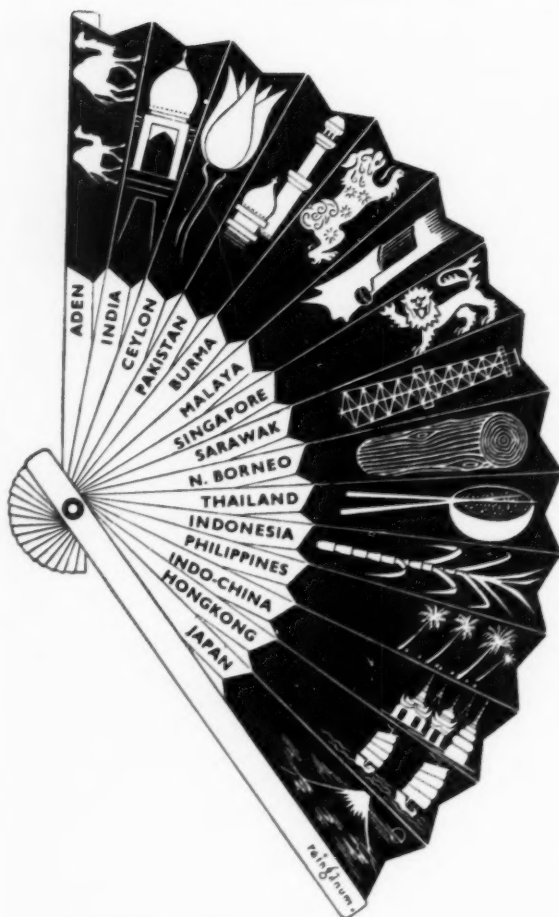
This information is supplied by the Special Register Information Service of the Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

Part of a contract totalling more than \$8,000,000 for equipment for the Indian Railway system is scheduled for completion in Britain this month with the delivery of the last of 25 locomotives. At the same time nearly 1,000 freight cars will have been shipped or booked for shipment.

Lucius Pitkin, Inc., a firm of metallurgical chemists and consultants with headquarters in New York, succeeded the American Smelting and Refining Company on February 1 as a contractor to conduct the uranium ore-buying and concentrate-receiving functions for the U.S. Atomic Energy Commission in the Western U.S.

Brush Export, of Loughborough, have secured two export orders worth more than £610,000 in the face of strong foreign competition. The contracts were awarded by the Ceylon Government for the extension and equipment of new power stations.

Under a newly signed trade agreement Yugoslavia will export lead, zinc and antimony to Holland.



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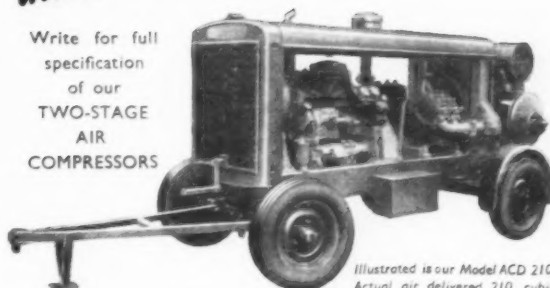


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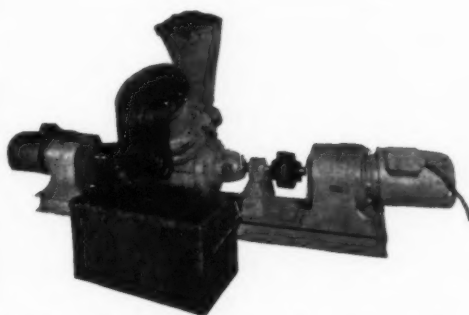
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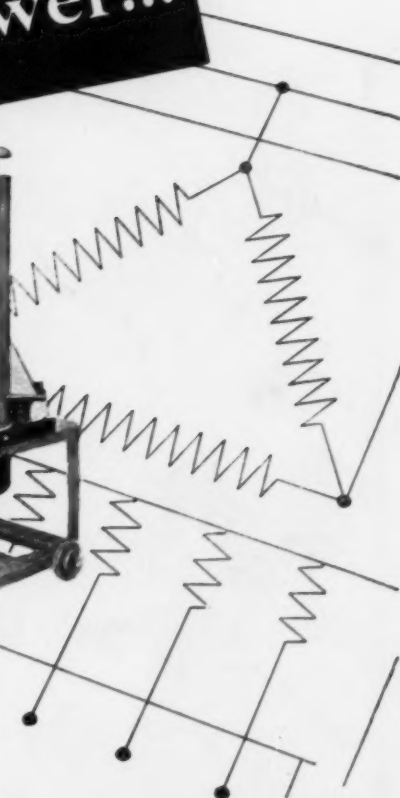
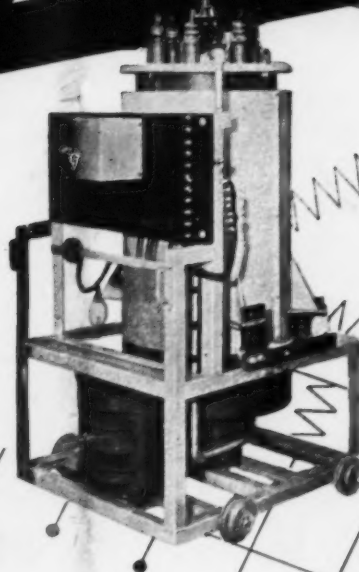
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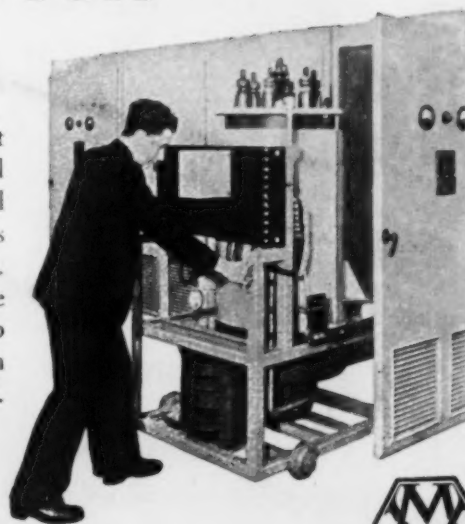
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